4.0 Field Investigations

This remedial investigation will consist of a six-phase approach. The investigation phases are as follows:

- Conduct an XRF survey of surface soil to determine soil boring and monitoring well locations
- Install a total of 50 soil borings and collect one surface soil sample and two discrete subsurface soil samples from each soil boring (a total of 50 surface soil samples and 100 subsurface soil samples)
- Collect surface soil samples from 50 locations for only surface soil, to be determined based on XRF surface soil screening results
- Install 10 residuum monitoring wells
- Collect 25 groundwater samples from 10 new and 15 existing monitoring wells
- Collect 30 surface water samples and 30 sediment samples.

XRF surface soil screening will be carried out in situ at approximately 460 locations within a grid installed covering the area of investigation for the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels, as shown on Figure 4-1. Surface soil samples for XRF screening will be collected at the grid line intersections or "grid nodes." Forty-five additional XRF screening locations have been selected in the Parcel 94Q range fan (Figure 4-2). The purpose of the XRF surface soil screening will be to screen the surface soils to identify areas potentially contaminated with lead. Soil borings and monitoring wells will be installed using the XRF surface soil screening results to collect samples for analysis to define the horizontal extent of the presence of lead. Additional grid node locations may be added and screened by XRF to expand the grid if elevated lead concentrations are detected along the perimeter of the proposed grid. Also, locations between the grid nodes may be screened by XRF to further define the horizontal extent of lead concentration within the grid.

A total of 50 soil borings will be installed at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels to provide data to determine the vertical and horizontal extent of potential contamination in soil. A total of 50 surface soil samples and 100 subsurface soil samples will be collected from the 50 soil borings. Forty of the 50 soil boring locations have been selected and are shown on Figure 4-4; XRF surface soil screening data may be used to adjust the final locations of these selected soil borings. The selection of the intervals for the discrete subsurface samples from these soil borings will be based on XRF screening of the subsurface soil showing the highest lead concentrations. The ten remaining soil borings will be installed based on XRF surface soil screening data and field conditions to select the locations.

An additional 50 locations will be selected using XRF surface soil screening data to collect surface soil samples only. Data from the surface soil sample analyses will aid in defining the horizontal extent of potential contamination in surface soil at the Choccolocco Corridor Ranges.

Ten residuum monitoring wells are proposed at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels, to be installed to an approximate depth of 50 feet. The ten monitoring well locations are shown on Figure 4-3. The final locations of the proposed residuum monitoring wells will be determined based on XRF surface soil screening results.

Twenty-five groundwater samples will be collected from the monitoring wells in the vicinity of the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels. Groundwater samples will be collected from the 10 proposed and 15 existing monitoring wells. Groundwater sample data will provide information on water quality in the residuum saturated zone; groundwater elevations measured in the monitoring wells will provide groundwater flow direction.

Thirty proposed surface water and sediment samples will be collected from intermittent stream locations at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels, as shown on Figure 4-3.

The following sections describe the field activities required to conduct the RIs at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels.

4.1 Utility Clearances

A utility clearance will be performed at all intrusive locations where soil borings or monitoring wells will be installed using the procedure outlined in Section 4.2 of the SAP (IT, 2002a). The site manager will mark the proposed locations with stakes, coordinate with the appropriate utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved for utility avoidance for intrusive sampling, the stakes will be labeled as cleared.

4.2 X-Ray Fluorescence Surface Soil Screening

XRF surface soil screening will be carried out in situ at approximately 500 locations within the area of investigation and the Parcel 94Q range fan of the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels shown on Figure 4-1. The purpose of the XRF surface soil screening will be to analyze the surface soil in the selected sample locations in the areas of previous elevated soil sample results for lead to define the horizontal extent of the presence of lead. The 200-foot grid shown in Figure 4-1 presents the proposed XRF surface soil sample locations. Samples will be collected at the grid line intersections or "grid nodes." Table 4-1 lists the coordinates for each grid node where surface soil will be collected for XRF screening. The limits of the grid were determined by reviewing the laboratory results of samples collected during the previous Shaw SIs for Parcels 94Q, 95Q, 96Q, 97Q, 131Q-X, 144Q-X, 145Q-X, 146Q, 147Q-X, and 148Q-X that are summarized in Chapter 2.0 of this RI SFSP. Forty-five additional XRF screening locations have been selected within the range fan for Parcel 94Q to screen for other areas of elevated lead concentrations (Figure 4-2).

XRF surface soil screening results will be compared to the ESV for lead (50 mg/kg) to determine the actual limits of the grid boundaries. The XRF grid may be extended if surface soil results at grid nodes along the perimeter of the grid indicate high levels of lead. After the initial XRF screening of surface soil at each grid node has been completed, additional sample locations between grid nodes may be selected for XRF screening to further define the horizontal extent of lead contamination. An additional 200 screening locations may be selected to expand the grid or further define areas between grid nodes. Results from the XRF surface soil screening will be used to aid in placing soil boring locations and surface soil sample locations and may be used to adjust the sample locations presented in Table 4-2 and shown on Figure 4-3.

The XRF surface soil screening will be conducted in accordance with the procedures specified in Section 6.9 of the SAP. Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP.

To perform this phase of the investigation, metals analysis will be completed on site using an energy-dispersive portable XRF instrument. Site surface soil areas will be prepared and analyzed in situ according to the methodology specified in this SFSP. Although the XRF instrument will measure and record a number of metals present at the screening location, lead has been selected as the primary indicator element of contamination from range use. XRF surface soil analysis provides screening-level data.

XRF surface soil screening measurements involve exposing the soil to a series of x-rays generated by radioactive sources stored within the instrument. Qualitative and quantitative data are generated by measuring the wavelength and frequency of the fluorescence of the metallic elements present in the soil. The fluorescence is a function of the x-ray strength and length of exposure during analysis. These data are captured and interpreted using an onboard data processor, then are reported via the display screen for manual recording in terms of concentration and standard deviation. The manufacturer's directions for instrument calibration, operation, and maintenance shall be followed explicitly. Select samples will be measured in duplicate to assess analytical precision.

Prior to the measurement, the analyst will perform the daily instrument calibration checks. In situ measurements will be conducted by the XRF analyst placing the instrument probe in direct contact with the soil. In situ measurements will be performed on areas where the soil has been prepared. This preparation will include the following steps:

- A visual assessment to ensure the soil is not wet (if the location is wet, an aliquot will be collected and prepared by oven drying in a mobile lab to remove moisture before analysis).

- Removal of rocks, vegetative material, and bullet fragments from the surface using a trowel or spoon.

- Thorough surficial mixing to break up the compacted soil.

- Hand tamping the soil into a small, compacted dome with a level surface for probe interface.

When a compacted, level surface is achieved, the probe is then placed onto the prepared surface and is checked for consistency of contact and the analysis is initiated. When the measurement is complete, the analyst will record the XRF surface soil sample result manually on the XRF surface soil sample collection log. The XRF instrument logger will also record the analytical result associated with the sample location identity in its internal memory. This process will be repeated to gather data for all identified locations.

During XRF calibration, the analyst will perform measurements on a blank matrix (Teflon® or quartz) and on two standard reference materials (SRM) purchased from the National Institute of Standards and Technology. SRM 2586 has a certified concentration of 432 mg/kg of lead, and SRM 2711 has a certified concentration of 1,162 mg/kg of copper. Successful calibration of the instrument will be based on a nondetect value for lead on the blank matrix sample while achieving a relative percent difference of less than 25 percent for the SRM-measured concentrations compared to their certified values for lead and copper. Calibrations will be performed at the beginning and end of each day's analysis.

In addition to the accuracy check of the calibration, the XRF instrument will be used to periodically measure the same location in duplicate to assess analytical precision. The check will be performed once every 20 field measurements, at the discretion of the XRF analyst.

XRF QA/QC surface soil samples will be collected and submitted for laboratory analysis by EPA Method 6010B for lead and copper. If the XRF instrument indicates locations with high concentrations of lead and copper, the XRF QA/QC surface soil samples will be collected from these locations. The XRF QA/QC surface soil samples will be collected at a frequency of 5 percent. Therefore, of approximately 700 potential surface soil sample locations, there will be approximately 35 laboratory XRF QA/QC surface soil samples collected. The number of actual XRF QA/QC surface soil samples will be determined on the actual number of surface soil samples screened by XRF. The XRF QA/QC samples, as listed in Table 4-3 of this SFSP, will be analyzed in the laboratory for lead and copper using the method presented in Section 4.6.

The XRF analyst will be responsible for manually recording the results of the instrument calibration and the results of each field measurement using the XRF calibration forms and the XRF surface soil sample collection form.

4.3 Environmental Sampling

The environmental sampling program during the RI for the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels includes the collection of surface and subsurface soil, groundwater, surface water, and sediment samples for chemical analyses. The proposed sampling is intended to provide sufficient data to complete the RI; however, if additional contaminants are detected, additional phases of groundwater monitoring well installation and sampling may be required.

4.3.1 Surface Soil Sampling

One hundred surface soil samples will be collected at the 50 soil boring locations and 50 surface soil locations proposed at the Former Choccolocco Corridor Ranges.

4.3.1.1 Sample Locations and Rationale

The sampling rationale for each proposed surface soil sample is listed in Table 4-2. Forty of the 50 soil boring locations have been selected and are shown on Figure 4-3. The remaining 10 soil boring locations and 50 surface soil locations will be collected will be determined based on results from XRF surface soil screening for lead. Surface soil sample designations and QA/QC sample requirements are summarized in Table 4-4. The final soil boring and surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

4.3.1.2 Sample Collection

Surface soil samples will be collected from the uppermost foot of soil by direct-push methodology as specified in Sections 5.1.1.1 and 6.1.1.1 of the SAP (IT, 2002a). In areas where site access does not permit the use of a direct-push rig, the samples will be collected using a stainless-steel hand auger as specified in Sections 5.1.1.2 and 6.1.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 6.8.3 of the SAP. Surface soil samples will be screened for information purposes only, not to aid in the selection of samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this RI SFSP are discussed in Section 4.0 and listed in Table 4-1 of the QAP. Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP. The 100 surface soil samples will be analyzed for the following sets of parameters listed in Section 4.6 of this RI SFSP:

- 30 surface soil samples analyzed for VOCs, SVOCs, metals, explosives, pesticides, herbicides, and polychlorinated biphenyls (PCB)

- 30 surface soil samples analyzed for metals and explosives.

- 40 surface soil samples analyzed for lead only.

4.3.2 Subsurface Soil Sampling

One hundred subsurface soil samples will be collected at the 50 soil boring locations proposed at the Former Choccolocco Corridor Ranges. Two discrete subsurface soil samples will be collected from each soil boring. The upper subsurface soil sample at each boring will be collected at a depth interval based on XRF screening of the subsurface soil intervals. The second (lower) subsurface soil sample from each soil boring will be collected from an interval below the first subsurface soil sample based on the XRF screening, but no deeper than 12 feet bgs. Section 4.3.2.2 describes the procedure for selecting the subsurface soil sample interval by XRF screening.

4.3.2.1 Sample Locations and Rationale

The sampling rationale for each proposed subsurface soil sample is listed in Table 4-2. Proposed soil boring locations are shown in Figure 4-3. Subsurface soil sample designations and QA/QC sample requirements are summarized in Table 4-4. The final soil boring locations will be determined in the field by the on-site geologist based on actual field conditions.

4.3.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Sections 5.1.1.1 and 6.1.1.1 of the SAP (IT, 2002a). In areas where site access does not permit the use of a direct-push rig, the samples will be collected using a hand auger, as specified in Sections 5.1.1.2 and 6.1.1.1 of the SAP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is met. A detailed lithogical log will be recorded by the on-site geologist for each borehole. Soil characteristics will be described using a "Burmister Identification System" outlined in Hunt (1986) and in accordance with American Society for Testing and Materials (ASTM) Method D 2488 using the Unified Soil Classification System (ASTM, 1993). Two subsurface soil samples will be collected from each soil boring at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels using either direct-push technology (DPT) or hand auger. XRF will be used in the field to screen the soil to determine the subsurface soil samples with the highest lead concentrations, which will be sent to the laboratory for additional analysis. The following describes the sample handling procedures that will be used to screen the subsurface soil intervals.

Whether the boring is installed with DPT or hand auger, the site geologist will describe the soil interval and record headspace readings for organic vapors as per the procedures specified in the SAP. The XRF technician will then composite the sample in a decontaminated stainless steel mixing bowl and transfer a representative aliquot for on-site analysis into a labeled disposable aluminum pan. Remaining soil will be transferred temporarily into a labeled Ziploc® bag and stored in a cooler on ice until the boring is complete. The aliquot for on-site analysis will be visually assessed for moisture content and, if the content is too high, the soil will be further prepared by oven drying. If the technician judges the soil is dry enough, the aliquot will be further mixed and hand-tamped using a sampling spoon, the XRF cover plate will be placed over the soil in a way to ensure good contact with the film window. The XRF will be placed over the cover plate and the analysis initiated. The XRF technician will monitor the output from the XRF during sample screening and, after an adequate amount of time has passed to quantify the lead and copper soil concentrations (approximately 120 seconds), the screening will be stopped. The technician will then record the results presented on the XRF liquid crystal display screen onto the

XRF analysis form. This process will be repeated until all intervals for a boring have been collected and DPT or auger refusal is encountered or the depth of the boring has reached 12 feet.

At that point, the XRF technician and the geologist will confer and review the available data. Intervals will then be selected for off-site analysis based on geological conditions, results of the headspace screening, and the XRF analysis. Selected depth interval samples will be removed from temporary storage in the cooler and aliquots will be collected to fulfill the analytical requirements specified in this SFSP. Site conditions such as lithology may also determine the actual sample depth intervals submitted for analysis. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 6.8.3 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Subsurface soil samples will be PID-screened for information purposes only, not to aid in selection of samples for analysis.

Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this RI SFSP are discussed in Section 4.0 and listed in Table 4-1 of the QAP. The 100 subsurface samples will be analyzed for the following sets of parameters listed in Section 4.6 of this RI SFSP:

- 30 subsurface soil samples analyzed for VOCs, SVOCs, metals, explosives, pesticides, herbicides, and PCBs

- 30 surface soil samples analyzed for metals and explosives

- 40 subsurface soil samples analyzed for lead only.

4.3.3 Monitoring Well Installation

Ten residuum monitoring wells are proposed at the Former Choccolocco Corridor Ranges. The monitoring wells will be installed using hollow-stem auger drilling methods. The wells will be installed to provide additional information on water quality and groundwater flow in the residuum saturated zone.

4.3.3.1 Monitoring Well Locations and Rationale

The proposed residuum monitoring wells will be installed to collect groundwater sample data and delineate the horizontal extent of potential contamination in the residuum saturated zone. Groundwater elevation measurements will be recorded to further characterize the local groundwater flow. The locations of the 15 existing monitoring wells and 10 proposed monitoring wells are presented on Figure 4-3. Table 4-2 presents proposed monitoring well locations and groundwater sampling rationale. The exact location of each proposed monitoring well will be determined in the field by the on-site geologist, based on XRF surface soil screening results and actual field conditions.

4.3.3.2 Permanent Residuum Monitoring Wells

The ten permanent residuum monitoring wells will be installed at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels using 4-1/4-inch inside diameter (ID) hollow-stem augers. Residuum monitoring wells will be drilled to a minimum of 20 feet below the first groundwater-bearing zone or to the top of bedrock, whichever is encountered first. Estimated depth of the proposed residuum monitoring wells is approximately 50 feet bgs. Soil samples will be collected at 5-foot intervals from 5 feet bgs (or at direct-push sample refusal) to the total well depth by the on-site geologist (to record lithologic information). The samples will be collected using a 24-inch-long, 2-inch-or-larger-diameter split-spoon sampler. Soil characteristics will be recorded in accordance with ASTM Method D 2488 using the Unified Soil Classification System and using a "Burmister Identification System" outlined in Hunt (1986). The soil samples will be screened in the field for the presence of VOC contamination using a PID.

The well casing will consist of new 2-inch ID, Schedule 40, threaded, flush-joint, polyvinyl chloride (PVC) pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap PVC well screen, 10 to 20 feet long. At the discretion of the Shaw site manager, a sump (composed of a new 2-inch ID, Schedule 40, threaded, flush-joint, PVC pipe) may be attached to the bottom of the well screen. After the casing and screen materials are lowered into the boring, a filter pack will be installed around the well screen. In wells installed to depths of 20 feet or less, the filter pack material will be gravity filled. In wells installed to depths of 20 feet or more, the filter pack will be tremied into place. The filter pack will be installed from the bottom of the well to approximately 5 feet above the top of the screen. The filter pack will consist of 20/40 silica sand. A fine sand (30/70 silica sand), approximately 5 feet thick, may be placed above the filter pack. A bentonite seal approximately 5 feet thick will be placed above the filter pack (or fine sand if used). The remaining annular space will be grouted with a bentonite-cement mixture, using approximately 6.5 to 7 gallons of water and approximately 5 pounds of bentonite per 94-pound bag of Type I or Type II portland cement. The grout will be tremied into place from the top of the bentonite seal to ground surface. Monitoring wells will be completed with stick-up or flush-mount construction as determined by the site geologist. IDW will be containerized and staged in accordance with Section 4.7 of this RI SFSP.

The monitoring wells will be drilled, installed, and developed as specified in Section 5.1 and Appendix C of the SAP (IT, 2002a). The exact monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions. Monitoring wells will be allowed to equilibrate for 14 days after well development prior to collecting groundwater samples.

4.3.4 Groundwater Sampling

Groundwater samples will be collected from the 15 existing monitoring wells and 10 proposed monitoring wells at the Former Choccolocco Corridor Ranges. Field parameters measured at the time of sample collection are detailed in Section 6.3 of the SAP.

4.3.4.1 Sample Locations and Rationale

The 15 existing and 10 proposed groundwater monitoring wells are depicted in Figure 4-3. The groundwater sampling rationale is listed in Table 4-2. The well locations were chosen to delineate the horizontal and vertical boundaries of the potential contaminants found in groundwater at the Former Choccolocco Corridor Ranges. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-5.

4.3.4.2 Sample Collection

Prior to sampling monitoring wells, static water levels will be measured from the monitoring wells to be sampled as part of this RI. Groundwater elevations will be used to define the groundwater flow in the residuum and bedrock aquifers. Water levels will be measured as outlined in Section 5.5 of the SAP (IT, 2002a). Groundwater samples will be collected in accordance with the procedures outlined in Section 6.1.1.5 and Attachment 5 of the SAP. Low-flow groundwater sampling methodology outlined in Attachment 5 of the SAP may be used as deemed necessary by the Shaw site manager.

Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this RI SFSP are discussed in Section 4.0, Table 4-1 of the QAP (IT, 2002a). The groundwater samples will be analyzed for VOCs, SVOCs, metals, explosives, pesticides, herbicides, and PCBs using the methods listed in Section 4.6 of this RI SFSP.

4.3.5 Surface Water Sampling

Thirty surface water samples will be collected from intermittent streams in the vicinity of the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels.

4.3.5.1 Sample Locations and Rationale

The surface water sampling rationale for each proposed location is listed in Table 4-2. The surface water samples will be collected from the proposed locations on Figure 4-3. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-6. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

4.3.5.2 Sample Collection

The surface water samples will be collected in accordance with the procedures specified in Section 6.1.1.3 of the SAP (IT, 2002a). Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are discussed in Chapter 4.0 and listed in Table 4-1 of the QAP. The surface water samples will be analyzed for VOCs, SVOC, metals, explosives, pesticides, herbicides, and PCBs using the methods listed in Section 4.6 of this SFSP.

4.3.6 Sediment Sampling

Thirty sediment samples will be collected from the same locations as the surface water samples described in Section 4.3.5.

4.3.6.1 Sample Locations and Rationale

The proposed locations for the sediment samples are shown in Figure 4-3. Sediment sampling rationale for each proposed location is presented in Table 4-2. The sediment sample designations and required QA/QC sample requirements are listed in Table 4-6. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

4.3.6.2 Sample Collection

The sediment samples will be collected in accordance with the procedures specified in Section 6.1.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Chapter 6.0 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are discussed in Chapter 4.0 and listed in Table 4-1 of the QAP. The sediment samples will be analyzed for VOCs, SVOCs, metals, explosives, pesticides, herbicides, PCBs, total organic carbon, and grain size using the methods listed in Section 4.6 of this SFSP.

4.4 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 6.5.1.1 of the SAP (IT, 2002a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 6.5.1.2 of the SAP.

4.5 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either GPS or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum 1983. Elevations will be referenced to the North American Vertical Datum of 1988.

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within one meter. Because of the need to use monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.4.1.1 of the SAP. Conventional land survey requirements are presented in Section 4.4.1.2 of the SAP.

4.6 Analytical Program

Selected samples collected at locations specified in this chapter of this SFSP will be analyzed for specific suites of chemicals and elements based on the history of site usage and previous investigation data, as well as EPA, ADEM, FTMC, and USACE requirements. Definitive target analyses for samples collected from the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels consist of the following list of analytical suites:

- TCL VOCs - EPA Method 5035/8260B
- TCL SVOCs - EPA Method 8270C
- Target Analyte List metals - EPA Method 6010B/7000
- Nitroaromatic/Nitramine Explosives - EPA Method 8330
- Chlorinated pesticides - EPA Method 8081A
- Organophosphorus pesticides - EPA Method 8141A
- Chlorinated herbicides - EPA Method 8151A
- PCBs - EPA Method 8082.

In addition, sediment samples will be analyzed for the following parameters:

- Total Organic Carbon – EPA Method 9060
- Grain size – ASTM D421/D422.

The samples will be analyzed using EPA SW-846 Update III methods where applicable, as presented in Table 4-7 of this RI SFSP and Section 5.0 of the QAP. Data will be reported in accordance with definitive data requirements of Chapter 2.0 of the USACE Engineer Manual 200-1-6, *Chemical Quality Assurance for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects* (USACE, 1997), and will be evaluated by the stipulated requirements for the generation of definitive data (Section 7.2.2 of the QAP). Chemical data will be reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms, along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

4.7 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures specified in Sections 6.1.3 through 6.1.7 of the SAP (IT, 2002a). Completed analysis request/COC records will be secured and included with each shipment of coolers to:

Attention: Sample Receiving/ Elizabeth McIntyre
EMAX Laboratories Inc.
1835 205th Street
Torrence, California 90501
Telephone: (310) 618-8889.

4.8 Investigation-Derived Waste Management

Management and disposal of IDW will follow procedures and requirements described in Appendix D of the SAP (IT, 2002a). The IDW expected to be generated at the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels will include drill cuttings, purge water from permanent monitoring well development and sampling activities, decontamination fluids, disposable sampling materials, and disposable personal protective equipment. The IDW will be characterized and staged at a secure location designated by the site manager while awaiting final disposal. Sampling of IDW to obtain analytical results for characterizing the waste for disposal will follow the procedures specified in Section 6.1.1.8 of the SAP (IT, 2002a). The IDW and water shall be containerized per methodology previously established during drilling activities at FTMC.

4.9 Site-Specific Safety and Health

Safety and health requirements for the RI are provided in the SSHP attachment for the Former Choccolocco Corridor Ranges, Parcels 94Q, 95Q, 96Q, 97Q, and Associated Parcels. The SSHP attachment will be used in conjunction with the installation-wide safety and health plan, Appendix A of the SAP (IT, 2002a).

5.0 Project Schedule

The project schedule for the RI activities will be provided by the Shaw project manager to the BCT.

6.0 References

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